

Effect of Acupressure Applied To BL23 Point versus Crushed Ice Application on Postpartum Perineal Pain Intensity

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Abstract

Background: Postpartum perineal pain is a distressing complaint affecting more than one fifth of women worldwide for about 10 days after normal vaginal delivery. It is always a nuisance to the new mother and can limit her mobility and quality of life which could have a negative impact on mother's adaptation to her new role. **Aim:** Evaluate the effect of acupressure applied to BL23 points versus crushed ice application on postpartum perineal pain intensity. **Methods:** A quasi-experimental research design was used. A convenient sample of 100 postpartum women was recruited. Three tools of data collection were used: (1) basic data structured interview schedule (2) Visual analog scale (VAS). (3) A modified version of Chamber Price pain rating scale (CPPRS). **Results:** The study results revealed that there was no significant difference found between the acupressure and crushed ice pack groups in relation to perineal pain intensity immediately after interventions $p= 0.106$, while 1 hour after interventions the pain scores of the acupressure group were significantly lower compared to the crushed ice pack group $p= 0.040$. **Conclusion:** The severity of perineal pain decreased in both groups, but the effect of acupressure was superior on perineal pain reduction for a long term basis. **Recommendations:** Maternity nurse should incorporate acupressure and ice application as non-pharmacological interventions in their nursing care of postpartum women with perineal pain.

Keywords: *Acupressure, Crushed ice application, Perineal pain & Postpartum.*

Introduction

The postpartum period is a stage in which a woman's body recovers from childbirth, it is expected to be an elated experience, but it also entails a number of significant physical and psychological changes. These changes are normal, but they may put a strain on mothers' ability to adjust. Hence, postpartum health care practitioners should pay a considerable attention to this critical period to promote positive adaptation and safe passage for the mother. One of the most prominent postpartum problems which negatively affects postpartum women's quality of life and adaptation is postpartum perineal pain (Jeong et al., 2021).

Postpartum perineal pain is a distressing complaint among mothers after vaginal delivery. About 85 percent of women experience some degree of perineal trauma after normal vaginal delivery, and more than 69 percent of them may need sutures (Soliman et al., 2020). During childbirth, perineal trauma can occur spontaneously as tears or lacerations and/or surgically, in the form of episiotomy (Jansson et al., 2020). Short- or long-term maternal morbidity related to perineal repair might prompt physical, social or psychological issues, influencing the woman's ability

to take care for her newborn and her family (Soliman et al., 2020).

More than one fifth of postpartum women undergone vaginal delivery suffer from perineal pain for about ten days (Molakatalla et al., 2017). Perineal pain is always a nuisance to the new mother and can limit her mobility and quality of life which could have a negative impact on mother's adaptation to her new role (Silva et al., 2018). In addition, it can cause limitations of the physical activities, insomnia and interferes with elimination; moreover, it may cause long term effects such as dyspareunia urinary incontinence, irritability and exhaustion. Postpartum nurses should actively endorse the ways to support postpartum women in managing their perineal pain and in turn adapt more easily to motherhood (Senol & Aslan, 2017).

The use of pharmacological pain relieving drugs is common during the early postpartum period. These drugs may be effective, but they cause unwanted side effects especially in breastfeeding babies (Pillitteri, 2014). So, it is safer to use non-pharmacological interventions with breastfeeding mothers who have episiotomy or perineal trauma. Cryotherapy (ice application), and acupressure are among the non-pharmacological interventions that could be used for

managing postpartum perineal pain (Smith et al., 2022).

Acupressure is one of common alternative therapies which grounded on the concept of life energy that runs through "meridians" in the body (Gönenç & Terzioğlu, 2020). Body self-healing is the aim of this method in which pressure is applied on 365 to 2000 skin points linked through twelve core energy paths (meridians) using either fingers, palms as well as hands, elbows or knees. Acupressure maintains a stability between Ying and Yang, increases the secretion of neurotransmitters, stimulates the opioid system, and helps the body to excrete carbon monoxide and lactic acid through the regulation of circulation and supplying the body with energy (Qi) resulting in maintaining the body's natural functioning and hence reduces pain (Demirel & Kaya, 2019).

BL23 acupressure point (Shenshu) located 1.5 cm lateral to the lower border of the second lumbar vertebra's spinous process on each side. This point has been used in management of gynecological disorders as infertility, irregular menstruation, persistent vaginal discharges and many types of pain including low back, knee pain, genital and perineal pain (Akbarzade et al., 2016).

Another non-pharmacological pain-relieving method is cold application in the form of ice packs or gel ice backs, it is a simple method that can be applied to help puerperal mother to reduce pain. It reduces pain effectively in two ways. Firstly, it minimizes edema resulting from inflammation or trauma by decreasing blood circulation to the perineum. Secondly, by slowing down the speed of nerve conduction causing temporary paresthesia of the peripheral nerve fibers and reducing the inflammatory reaction and working as a counterirritant. It also reduces the skin temperature of the underlying tissues, stimulating alpha receptors in the blood through the sympathetic nervous system which in turn decreased pain (Oliveira et al., 2012; Syaiful et al., 2020).

Perineal pain if properly assessed and treated early; do not represent a real threat to the adaptation of maternal role. Maternity nurses have a crucial role in the assessment and proper management of postpartum perineal pain and a significant contribution in the evaluation of the strength of evidence of such non pharmacological interventions to provide safe and effective interventions for postpartum women with perineal pain.

Significance of the study

Considering the high rate of postpartum women who suffer from perineal pain and its negative effect on the quality of their lives, and the need for studies to test and support the effectiveness and safety of some non pharmacological techniques which could benefit a wide range of women suffering from postpartum perineal pain (Soliman et al., 2020). Therefore, this study was carried out to verify the effect of

acupressure versus crushed ice application on postpartum perineal pain.

Aim of the study:

Evaluate the effect of acupressure applied to BL23 point versus crushed ice pack application on postpartum perineal pain intensity.

Hypotheses:

Postpartum women who receive acupressure exhibit less perineal pain than those who receive crushed iced pack.

Postpartum women who receive crushed ice pack exhibit less perineal pain than those who receive acupressure.

Subjects and Method

Research design:

A quasi-experimental design was utilized, where the effect of independent variables (acupressure and crushed ice pack) on dependent variable (postpartum perineal pain) was examined.

Setting:

This study was conducted at the postpartum unit of El- Shatby Maternity University Hospital in Alexandria governorate, Egypt. This setting was chosen as it is the largest maternity health agency in Alexandria and the turnover is appropriate for the study.

Subjects:

A convenient sample of (100) postpartum women were recruited from the previously mentild setting according to the following criteria:

1. Full-term pregnancy (37–42 weeks)
2. Singleton fetus in cephalic presentation
3. Women >18 years of age, within 2–24 hours after childbirth with perineal pain reported >3 points on visual analogue scale
4. Have a normal vaginal delivery with episiotomy
5. Did not receive epidural anesthesia, ice packs and anti-inflammatory drugs or analgesics 3-6 hours prior to the application of interventions.
6. Not suffering from any major physical problems such spinal fractures, disc hernias, or acute vertebral inflammation.

Epi- info version 7 statistical software was utilized to calculate the sample size according to the following: total population over 2 months was 1000 women, 50% expected frequency, 10% acceptable error and 95% confidence coefficient. The estimated minimal sample size = 90 women

The participants were randomly divided into two equal groups as follows:

Group 1: The crushed ice pack group which involved 50 participants.

Group 2: The acupressure group which comprised the other 50 participants

Tools of data collection:

Tool I: Basic data structured interview schedule:

It was developed by the researchers and includes the following:

1. Socio-demographic characteristics, such as age, education, occupation, marital status and residence.
2. Obstetrical history including: gravidity, parity, number of abortions, and number of living children.
3. Present history: Weeks of gestation.

Tool II: Visual analog scale (VAS).

This tool was initially developed by **Melzack & Katz (1994)**, and then revised for its reliability and validity by **BIJUR (2001)**. It is a self-report tool consists of a horizontal line that's used to estimate women's pain subjectively. It encompasses ten point numerical scale that corresponds to the severity of pain with zero indicating no pain and ten indicating the worst degree of pain. Between these two extremes, each 3cm distance is labeled as mild, moderate, severe, or unbearable pain respectively. The total score range from 0-10 as follows: no pain (0), mild pain (1-3), moderate pain (4-6), severe pain (7-9) and unbearable pain (10).

Tool III: A modified version of Chamber Price pain rating scale (CPPRS).

This tool was initially developed by **Chamber Price in 1967**. It is used to assess pain behavioral responses through four main dimensions including posture, gross motor activity, facial expression as well as verbalization. For each of these four main behavioral responses the researcher selects one of three options. For posture, the researcher can choose between very relaxed, guarded and tense posture. In relation to gross motor activity the options are very restless, slightly restless and quiet. No frowning, some frowning and constant frowning or grimacing are the options for facial expression. Finally, the researcher can select between normal no sound, groans or moans and cries or sobs for assessing women's verbalization during pain.

Each of the 12 options was given a score (0, 1, 2). The total score was ranged from 0-8 as follows:

- No pain=0, Mild pain=1-2, Moderate pain=3-4, Severe pain=5-6 and Unbearable pain= 7-8

Method**Approvals**

- An approval from Scientific Research Ethical Committee, Faculty of Nursing, Alexandria University was obtained.
- Written permission was obtained from the relevant authority after explaining the study's goal.
- The researchers attend a training workshop on acupressure at the Arab African Union, Supreme Body for Complementary Medicine affiliated to Ministry of Culture and Investment at Alexandria governorate and an accredited certificate was obtained.

Tools development

- Tool I was developed by the researcher after reviewing the recent relevant literature.

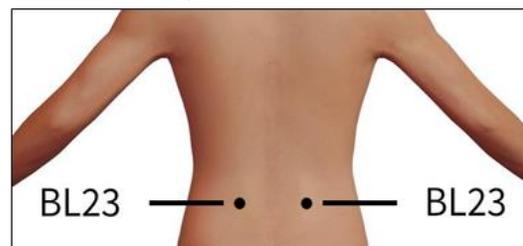
- Tool II and III were adopted and translated into Arabic language.
- Tools content validity was tested by a jury of 5 experts in the related field.
- The reliability of the tools was tested using Cronbach Alpha test (internal consistency) and results were satisfactory (0.755, 0.833).

Pilot study

It was conducted on 10 percent of the sample (ten women) to ensure the clarity and applicability of the tools, identify obstacles and problems that may be encountered as well as to estimate the time needed for data collection. Accordingly, the necessary modifications were made. Women participating in the pilot study were excluded from the main study sample.

Collection of data

- Basic data was gathered using tool (I)
- Subjects were assigned to one of two groups as follows:
 - Group 1 (acupressure group) comprised of 50 women to whom acupressure was applied by the researcher. The researcher applied pressure on BL 23 points with the thumb, for 5 minutes in counterclockwise direction. In the second 5 minutes, pressure was applied on the opposite direction for 5 minutes. Similarly the pressure was continued for 20 min.



- Group 2 (crushed ice pack group) which comprised of 50 women to whom crushed ice pack was applied by the researcher for 20 minutes within 2-24 hours after delivery with pain intensity greater than 3 on the visual analogue scale. The ice bag was prepared by putting crushed ice in a 15 cm plastic bag wrapped in thin cotton gauze prior to local application to avoid direct contact with the skin. During this intervention, all women were asked to take off their underpants and sanitary pads and remain in the dorsal position. The ice was always crushed to provide the best alignment with the perineal contours.
- Pain state was evaluated for both groups three times: the 1st time before interventions, the 2nd time immediately after interventions, and the 3rd time 1 hour afterwards using tool II and III.
- Comparison between the two groups was made to determine which intervention induces less perineal pain

- Data collection process takes 3 months starting from mid-May 2021 to the end of August 2021.

Statistical analysis

Descriptive and analytical statistics were utilized including percentages, mean & SD; whereas Chi-square-test, Fisher Exact-test, Wilcoxon test, Mann Whitney test and t-test were used to find out the difference in the results at 0.05 (5%) level of significance.

Ethical considerations

Written informed consent was obtained from women before data collection and after explanation of the study aim. Also, all women who accepted to participate in the study were assured about confidentiality, privacy and the right to withdraw from the study at any time.

Results

Table (1): Socio- demographic characteristics of the studied women

Socio-demographic characteristics	Acupressure group (no=50)		Crushed ice group (no=50)		χ ² (P)
	No	%	No	%	
Age (years)					
<20	13	26.0	11	22.00	0.6405 (0.726)
20-30	23	46.0	27	54.00	
>30	14	28.0	12	24.00	
Min-Max	18-40		19-38		
Mean ±SD	27.44 ± 7.212		26.78 ± 6.370		
Level of education					
Illiterate	7	14.00	8	16.00	0.6449 (0.958)
Read and write	10	20.00	9	18.00	
Primary and preparatory	13	26.00	11	22.00	
Secondary	19	38.00	20	40.00	
University	1	2.00	2	4.00	
Occupation					
Housewife	47	94.00	48	96.00	0.2105
Working	3	6.00	2	4.00	(0.646)
Residence					
Urban	30	60.00	25	50.00	1.010
Rural	20	40.00	25	50.00	(0.315)

χ² (p): Chi square test & p for χ² test

Statistically significant at p ≤ 0.05

Table (2): Distribution of the study groups according to their reproductive history

Reproductive history	Acupressure group (no=50)		Crushed ice group (no=50)		X ² (P)
	No	%	No	%	
Gravidity:					
1	46	92.00	44	88.00	0.444 (0.505)
2	4	8.00	6	12.00	
Parity:					
1	45	90.00	44	84.00	0.345 (0.842)
2	4	8.00	4	8.00	
Not applicable	1	2.00	2	4.00	
No of abortion					
0	49	98.00	48	96.00	0.344 (0.558)
1	1	2.00	2	4.00	
No of living children					
1	45	90.00	44	88.00	0.102 (0.749)
2 or more	5	10.00	6	12.00	

X² (p): Chi square test & p for X² test

Statistically significant at p ≤ 0.05

Table (3): Distribution of the study groups according to their weeks of gestation at delivery

Weeks of gestation at delivery	Acupressure group (no=50)		Crushed ice group (no=50)		□ [□] (P)
	NO	%	NO	%	
37 weeks	7	14.00	6	12.00	0.6878 (0.876)
38 weeks	7	14.00	9	18.00	
39 weeks	20	40.00	17	34.00	
40 weeks	16	32.00	18	36.00	
Min-Max	37 – 40		37 - 40		
Mean ±SD	38.90 ±1.015		38.94 ±1.018		

□□ (p): Chi square test & p for □□ test

Statistically significant at p ≤ 0.05

Table (4): Comparison between the study groups according to their perineal pain intensity as measured by visual analogue scale (VAS) before and after intervention.

Intensity of pain	Acupressure group (no=50)						Crushed ice group (no=50)						χ^2 (P)
	Before intervention		Immediately after intervention		1 hour after intervention		Before intervention		Immediately after intervention		1 hour after intervention		
	No	%	No	%	No	%	No	%	No	%	No	No	
No pain	0	0.00	2	4.0	1	2.0	0	0.00	0	0.00	0	0.00	Before intervention P4= 4.323(0.633)
Mild pain	0	0.00	29	58.0	33	66.0	0	0.00	26	52.0	28	56.0	Immediately after intervention P5= 15.771 (0.106)
Moderate	18	36.0	16	32.0	15	30.0	19	38.0	12	24.0	16	32.0	After 1 hour intervention P6= 16.156 (0.040) *
Severe	26	52.0	3	6.00	1	2.0	24	48.0	10	20.0	6	12.0	
Unbearable	6	12.0	0	0.00	0	0.00	7	14.0	2	4.0	0	0.00	
Min –Max	4-10		0-9		0-7		4- 10		1-10		1-8		
Mean \pmSD	7.30 \pm 1.568		3.92 \pm 2.009		2.28 \pm 1.654		7.26 \pm 1.688		4.64 \pm 2.229		3.20 \pm 2.148		
Z(p)before/after/1hour after within each group	P1a= -6.269 (0.000) *						P1c= - 6. 103 (0.000) *						
	P2a= -6.245 (0.000) *						P2c= - 6.198 (0.000) *						
	P3a= -5.942 (0.000) *						P3c= - 4.792 (0.000) *						

z: Wilcoxon test X² (p): chi-square test & p for X² * Significant at P \leq 0.05

FET (P): Fisher Exact Test & P for FET

PA: P for the acupressure group PC: P for the crushed ice group

(P1c): significance test before intervention and immediately after intervention for the crushed ice group

(P2c): significance test before intervention and after 1 hour intervention for the crushed ice group

(P3c): significance test immediately after intervention and after 1 hour intervention for the crushed ice group

(P1a): significance test before intervention and immediately after intervention for the acupressure group

(P2a): significance test before intervention and after 1 hour intervention for the acupressure group

(P3a): significance test immediately after intervention and after 1 hour intervention for the acupressure group

P4: Significance test before providing intervention session between the crushed ice and acupressure groups

P5: Significance test immediately after providing intervention session between the crushed ice and acupressure groups.

P6: Significance test 1 hour after providing intervention session between the crushed ice and acupressure groups

Table (5): Comparison between the study groups according to their total score of perineal pain as measured by modified version of chamber price pain rating scale (CPPRS)

Intensity of pain	Acupressure group (no=50)						Crushed ice group (no=50)						Mann-whitney(U)
	Before intervention		Immediately after intervention		1 hour after intervention		Before intervention		Immediately after intervention		1 hour after intervention		
	No	%	No	%	No	%	No	%	No	%	No	%	
No pain	0	0.00	2	4.0	2	4.0	0	0.00	0	0.00	0	0.00	Before intervention U1= 1212.00(0.785)
Mild pain	0	0.00	30	60.0	35	70.0	0	0.00	25	50.0	33	66.0	
Moderate	18	36.0	14	28.0	11	22.0	19	38.0	15	30.0	10	20.0	After 1 hour intervention U3= 992.00(0.042)*
Severe	23	46.0	4	8.0	2	4.0	24	48.0	8	16.0	6	12.0	
Unbearable	9	18.0	0	0.00	0	0.00	7	14.0	2	4.0	1	2.00	
Min-Max	3 - 8		6		0-5		3 - 8		1 -7		1 - 8		
Mean ±SD	5.38± 1.483		2.62±1.276		1.6±1.159		5.32± 1.518		3.12±1.423		2.48 ± 2.082		
Z(p)before/immediately /after/1hour after within each group	P1a= -6.245 (0.000) * P2a= -6.227 (0.000) * P3a= -6.244 (0.000) *						P1c= - 6.272(0.000) * P2c= - 6.240 (0.000) * P3c= -4.824 (0.000) *						

z: Wilcoxon z: Wilcoxon

U: Mann Whitney test

* Significant at $P \leq 0.05$

P1c): significance test before intervention and immediately after intervention for the crushed ice group

(P2c): significance test before intervention and after 1 hour intervention for the crushed ice group

(P3c): significance test immediately after intervention and after 1 hour intervention for the crushed ice group

(P1a): significance test before intervention and immediately after intervention for the acupressure group

(P2a): significance test before intervention and after 1 hour intervention for the acupressure group

(P3a): significance test immediately after intervention and after 1 hour intervention for the acupressure group

p1: Significance test before providing intervention session between the crushed ice and acupressure groups

P2: Significance test immediately after providing intervention session between the crushed ice and acupressure groups.

P3: Significance test 1 hour after providing intervention session between the crushed ice and acupressure groups

Table (6): Number and percent distribution of the acupressure and crushed ice groups according to their behavioral responses to perineal pain intensity as measured by a modified version of Chamber Price pain rating scale (CPPRS) before and after intervention.

Behavioral responses	Before intervention				Immediately after intervention				1 hour after intervention			
	Acupressure group (no=50)		Ice (no=50)		Acupressure group (no=50)		Ice (no=50)		Acupressure group (no=50)		Ice (no=50)	
	No	%	No	%	No	%	No	%	No	%	No	%
Postures												
Relaxed body posture	2	4.00	1	2.00	20	40.00	14	28.00	32	64.00	31	62.00
Guarded body posture	24	48.00	33	66.00	25	50.00	29	58.00	17	34.00	16	32.00
Tense body posture	24	48.00	16	32.00	5	10.00	7	14.00	1	2.00	3	6.00
Gross motor activity												
Quite	0	0.00	4	8.00	15	30.00	12	24.00	28	56.00	21	42.00
Slightly restless	30	60.00	28	56.00	32	64.00	33	66.00	21	42.00	25	50.00
Very restless	20	40.00	18	36.00	3	6.00	5	10.00	1	2.00	4	8.00
Facial expression												
No frowning	0	0.00	0	0.00	20	40.00	12	24.00	25	50.00	20	40.00
Some frowning	36	72.00	29	58.00	29	58.00	32	64.00	25	50.00	26	52.00
Constant frowning /grimacing	14	28.00	21	42.00	1	2.00	6	12.00	0	00.00	4	8.00
Verbalization												
Normal or no sound	5	10.00	4	8.00	25	50.00	15	30.00	35	70.00	25	50.00
Groans/ moans	35	70.00	36	72.00	24	48.00	31	62.00	15	30.00	21	42.00
Cries/sobs	10	20.00	10	20.00	1	2.00	4	8.00	0	0.00	4	8.00

Table (1): Shows that the mean age of acupressure and crushed ice groups was (27.44 ± 7.212) and (26.78 ± 6.370) respectively. Regarding, the level of education it was obvious that 38% & 40% of acupressure and crushed ice groups respectively had secondary education. The table also shows that 94% & 96% of both groups respectively were housewives. In addition, 60% & 50% respectively were from urban areas.

No significant differences were observed between the acupressure and crushed ice pack groups in relation to all sociodemographic parameters ($p = (0.726), (0.958), (0.646)$ and (0.315)).

Table (2): Presents the reproductive history of the study subjects. Regarding gravidity, it was observed that 92% & 88 % of acupressure and crushed ice groups respectively were primigravida while 90% & 84% of them respectively were primiparous. The majority (98% & 96%) of both groups had no history of abortion. The table also shows that 90% and 88% of acupressure and crushed ice pack groups respectively have only one child.

There were no statistically significant differences between the acupressure and crushed ice group in relation to their reproductive history where $p = (0.505, 0.842, 0.558 \& 0.749)$.

Table (3): Illustrates that 40% of acupressure group were in 39 weeks of gestation compared to 34% of crushed ice pack group. Moreover, 32% & 36% of both groups respectively were in 40 weeks of gestation. The table also shows that the mean gestational age was almost the same (38.90 ± 1.015 and 38.94 ± 1.018) among the two groups respectively.

No statistically significant difference was observed among the acupressure and crushed ice groups in relation to their weeks of gestation where, $P = 0.876$.

Table (4): Demonstrates that 52% & 48% of acupressure and crushed ice groups respectively had severe pain **before interventions**. Meanwhile, more than 1 third (36% & 38%) of both groups respectively had moderate pain. In addition, 12% & 14% of them respectively had unbearable pain.

Immediately after interventions, mild pain increased from (0% to 58%) and from (0% to 52%) among acupressure and crushed ice groups respectively. Moreover, severe and unbearable pain dramatically reduced from 52% to 6% and from 12% to 0% respectively among the acupressure group while they declined from 48% to 20% and from 14% to 4% respectively in crushed ice group.

1 hour after interventions: Further reduction was observed in severe pain from to 6% to 2% and unbearable pain remained 0% among the acupressure group while severe and unbearable pain reduced from 20% to 12% and from 4% to 0% respectively in

crushed ice group. Moreover mild pain increased from 58% to 66 % among acupressure group compared to 52% to 56% among crushed ice group.

No statistically significant difference was detected among the acupressure and the crushed ice pack groups before and immediately after interventions, where $P = (0.633 \& 0.106)$ respectively. However, a significant difference was found between both groups 1 hour after interventions where $p = (0.040)$, this indicates that acupressure has better effect on reducing pain intensity on long term basis.

In addition, a highly significant differences were also detected among women of each group before, immediately, and 1 hour after interventions regarding to the intensity of perineal pain as measured by visual analogue scale (VAS), where $P = 0.000$. This means, both interventions seem to be effective in decreasing the intensity of perineal pain.

Table (5): Clarifies that both groups had almost similar scores **before the interventions** as n1 of women in both groups had no pain and / or mild pain. Besides, moderate and severe pain was observed in 36% and 46% respectively of acupressure group compared to 38% and 48% respectively of the crushed ice pack group. Moreover, unbearable pain was found among 18% & 14% of women in acupressure and crushed ice pack groups respectively.

Immediately after interventions, mild pain increased from (0% to 60%) in the acupressure group and it increased from (0% to 50%) in the crushed ice pack group. severe and unbearable pain dramatically reduced from 46% to 8% and from 18% to 0% respectively among the acupressure group, while they reduced from 48% to 16% and from 14% to 4% respectively in the crushed ice group.

1 hour after interventions, further reduction in severe pain was noticed in acupressure group from 8 % to 4% and unbearable pain still 0%, while in crushed ice group severe pain decreased from 16% to 12% and unbearable pain decreased from 4 to 2%.

No statistically significant differences were observed between acupressure and crushed ice pack groups before and immediately after the interventions, where $p = (0.785 \& 0.084)$ respectively, However, a significant difference was found between both groups 1 hour after intervention in favor of acupressure group where, ($P = 0.042$).

In addition a highly significant differences were also detected among women of each group before, immediately, and 1 hour after interventions concerning perineal pain intensity, where $P = 0.000$.

Table (6): Exhibits distribution of acupressure and crushed ice groups regarding to their behavioral responses to perineal pain intensity. **Before interventions,** concerning posture, guarded position was found in 48% of the acupressure group compared

to 66% of crushed ice group. While, tense body posture was noticed in 48% and 32% of acupressure and crushed ice group respectively.

Immediately after interventions, (10% & 14%) of acupressure and crushed ice groups respectively had a tense body posture. Moreover, 50% & 58%, respectively of acupressure and crushed ice groups have guarded body posture, whereas tense body posture decreased from 48% to 10% among acupressure group and decreased from 32% to 14% among the crushed ice group.

1hour after interventions, the percentages of tense body posture decreased from 10% to 2% and from 14% to 6% among acupressure and crushed ice groups respectively.

As regards gross motor activity: before interventions, close percentages (60% & 56%) of acupressure and crushed ice groups respectively were slightly restless. While, (40% & 36%) of acupressure and crushed ice groups respectively were very restless. No one had a quite gross motor activity in the acupressure group compared to 8% of crushed ice group.

Immediately after interventions, the percent of participants who were very restless reduced from 40% to 6% in the acupressure group while, it decreased from 36% to 10% among crushed ice group.

1 hour after interventions, further reduction was noticed in women who were very restless from 6% to only 2% among acupressure group and from 10% to 8% among ice group.

Considering the facial expression, before the intervention, 72% & 58% of acupressure & crushed ice groups respectively had some frowning. Meanwhile, those who had constant frowning constituted (28 % & 42%) respectively of acupressure & crushed ice groups.

Immediately and 1hour after interventions, the percent of women who were constantly frowning reduced from 28% before intervention to 2% immediately after intervention & to 0.00% 1hour after intervention among the acupressure group. While, it reduced from 42% before intervention to 12% immediately after intervention & to 8% 1hour after intervention among ice group.

Referring to verbalization: before intervention, more than two thirds (70.00% & 72.00%) of acupressure & ice groups respectively were moaning from pain while, 20.00% of both groups were crying.

Immediately and 1hour after interventions, the percent of those who were crying among the acupressure group decreased from 20 % to 2.00% immediately after intervention and decreased to 0.00% 1hour post intervention. Meanwhile, it reduced from 20.00% before intervention to 8.00%

immediately & 1hour after intervention among crushed ice group.

Discussion

Postpartum perineal pain negatively affects the mother's recovery. It is a prevalent symptom that may occur immediately following birth and persists beyond the postnatal period even if the perineum is intact, some women may report pain (Francisco et al., 2014). Postpartum pain could be severe enough to cause potential detrimental impacts on women's physical and psychological functions which may interfere her transition to motherhood (Silva et al., 2018). Therefore, effective and safe pain management should be provided as 1 of the important nursing care interventions for postpartum women.

Whilst pharmacological pain relief may be effective, its side effects sometimes outweigh their benefits especially among breastfeeding mothers so, recently the move is toward testing safe and effective non-pharmacological pain relieving measures (Smith et al., 2022). These measures include transcutaneous electrical nerve stimulation, acupuncture, local cooling (cryotherapy) and acupressure (Peleckis et al., 2017 & Dutra et al., 2019). It is more effective to apply more than one intervention for more pain control to act on the different aspects of pain, so the current study investigated the effect of crushed ice pack application versus BL23 point acupressure on postpartum perineal pain intensity.

The findings of the present study declared that both acupressure and crushed ice pack were effective in reducing perineal pain intensity but acupressure seemed to be a little bit better than crushed ice on long term basis, this was obviously observed when women reported a substantially greater reduction in their pain levels immediately and one hour after applying interventions where severe & unbearable pain showed a significant reduction.

This result is similar with a randomized controlled study conducted by Solt Kirca & Kanza Gul (2020) to determine the effect of acupressure applied to LV4 and LI4 points on perceived acute postpartum perineal pain after vaginal birth with episiotomy. They concluded from their study that there was no significant difference immediately after applying the acupressure and ice package in relation to the mean pain scores of both groups as both interventions found to be effective while after 30, 60 and 120 minutes, they found that the mean pain scores were statistically significant between acupressure and ice groups, this study and the current study concluded that ice pack application is effective in short term and acupressure has a long term cumulative effect.

In relation to the effectiveness of acupressure in reducing postpartum perineal pain intensity, the

current study results revealed a statistically significant difference before and after applying acupressure; this result is matching with that of **Akbarzade et al., 2016** who reported the effectiveness of BL23 point acupressure on decreasing postpartum pain intensity in their study. Another study carried out by **Handayani & Cahyono (2020)** to test the effect of acupressure on pain levels in postpartum women revealed that pain intensity decreased to be mild in 62.5% of the studied women. Moreover, the current result is relatively in agreement with **Sipahutar et al. (2019)** who concluded that combining acupressure and yoga had strong positive effect on reducing postpartum pain intensity.

Additionally, another study carried out by **Afravi et al. (2019)** to test the effectiveness of Hugo point acupressure on perineal pain among postpartum multiparous women showed that pain intensity is reduced two hours after delivery as a result of applying Hugo point acupressure and a statistically significant difference was observed between the study and control groups.

Moreover, such similarity between the results of the current study and the aforementioned supporting studies in relation to the effectiveness of acupressure, is also observed in the relevant literature in which it is well acknowledged that acupressure techniques can effectively reduce pain and promote relaxation where activation of specific points by pressure enables local pain reduction elsewhere in the body. This effect can be explained according to Gate Control Theory in which the pleasurable impulses passed to the brain four times faster than painful stimuli through specific points. Another favorable effect of acupressure is the production of cortisol resulting in a relaxation effect, it also regulates the physiological response by increasing serotonin and endorphin transmission to the brain and specific organs through meridians and nerves (**Mehta et al., 2017**).

On the other hand, a discrepancy found from a randomized controlled study carried out by **Kwan & Li, 2014** about the effect of ear acupressure on perineal pain in postpartum women, they revealed that no significant difference was detected between the intervention and control groups in relation to pain perception after applying ear acupressure. The reasons for such discrepancy may be attributed to the differences in research methods, setting, site of applying intervention, the size of sample, statistical analysis and other parameters of research.

Likewise, the results of this study also disclosed a satisfactory reduction in postpartum pain intensity among ice packing group, where a highly significant difference was detected before and after its application for 20 minutes. This positive effect may be attributed to the fact that cold application for 10 to

20 minutes could lower the skin temperature 10 C° to 15 C° and have a local pain-relieving and swelling reduction effects as a result of capillary vasoconstriction, reduction of the temperature in the application area, slowing metabolism and decreasing edema by reducing capillary permeability and bleeding (**East et al., 2020**). Also cold application reduces the risk of hematoma formation and bacterial activity, additionally, it relieves pain by slowing down the speed of nerve conduction (**Mahishale et al., 2016 & Syaiful et al., 2020**).

This result is consistent with a study carried out by **El-Saidy et al. (2018)** titled "Effect of applying crushed ice gel pads on episiotomy pain and wound healing among postpartum primiparous women", the study revealed that women to whom crushed ice gel pad was applied at postpartum period reported a decreased level of episiotomy pain. Another supporting randomized controlled trial was executed by **Francisco et al. (2018)** titled "Ice pack induced perineal analgesia after spontaneous vaginal birth", they concluded that effective pain relief was achieved and maintained for 2 hours when ice-pack was applied to the perineum for 10 minutes. Moreover, a congruent randomized controlled study carried out by **Beleza et al. (2017)** revealed that the application of cryotherapy for 20 minutes is effective in relieving postpartum episiotomy pain after vaginal delivery.

In Addition, the current result is also in harmony with that of **Shehta et al. (2017)** who detected a highly significant difference between the study and control groups regarding pain intensity, where cold gel packs found to be effective in decreasing episiotomy pain. Besides, a similar result obtained from **Senol & Aslan (2017)** who reported that cold gel pad lowering perineal pain intensity after vaginal deliveries, a supporting result also revealed by **Lu et al. (2015)** in their study about the efficacy of cold gel packs in relieving episiotomy pain. Again the current result is conformable with that of a study carried out by **Leventhal et al. (2011)** which revealed the effectiveness 20 minutes application of ice packs in relieving perineal pain after vaginal birth. In opposition to this result, **Morais et al. (2016)** reported that cryotherapy did not change the levels of perineal pain, neither does it substitute the use of analgesic drugs. The explanation of such divergence may be attributed to the differences in level of pain and subjects' inclusion criteria between the two studies.

Finally, postpartum pain assessment is one of the important responsibilities of the midwife, using multiple tools of pain assessment is useful in maintaining more reliable results. Therefore, it might be valuable to combine VAS scores with verbal and behavioral responses for a more extensive assessment

and effective treatment choices, so in a trial to accurately assess postpartum perineal pain intensity, the current study utilized a subjective as well as a behavioral pain assessment tools. In this respect, when the intensity of postpartum perineal pain was assessed before and after acupressure and crushed ice pack application by evaluating participants' behavioral responses to such pain, it was pleasing to observe a satisfactory improvement to the favor of acupressure group, where relaxed body posture, quiet gross motor activities, no frowning facial expression and no cries or sobs are observed 1 hour after applying intervention.

Conclusion:

both acupressure and crushed ice packing found to have a satisfactory pain reduction results, ice may be used for short term pain relieve while acupressure could be used when a long term pain relive is needed, both are considered to be useful and cost effective strategies for managing of postpartum perineal pain.

Recommendations:

Based on the results of the current study the following recommendations are suggested:

1. Maternity nurse should incorporate acupressure and ice application as non pharmacological approaches in their nursing care of postpartum women with perineal pain
2. The curricula of midwifery education should include correct, relevant evidence-based information about non-pharmacological management of postpartum perineal pain.
3. Training programs for nurses in postpartum units about the utilization of nonpharmacological Interventions are recommended.
4. Replication of this study on a wide scale and on other types of pains during the maternity cycle.

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